

REMARKS

Claims 1-21 are pending, and the independent claims are 1, 17, 18, 19, and 20. All claims are rejected, except for dependent claims 9, 14, and 16.

The Office Action asserts that the rejected claims are obvious under 35 U.S.C. 103(a) from admitted prior art (pages 1-4 of the specification, and figure 1) in view of *Brown et al.* (U.S. Patent No. 6,388,636).

All of the independent claims are now amended, except for claim 17 which Applicant respectfully submits should be allowable without amendment.

Applicant respectfully notes that the non-final Office Action *did not give any explanation* for the rejection of claim 6, and Applicant respectfully submits that claim 6 should not have been rejected. The limitations of claim 6 are now inserted into claim 1.

Claim Amendments

In order to expedite prosecution, the following claim amendments are made without prejudice. As mentioned, the feature *wherein said at least one second PWB acts as a parasitic antenna element* of original claim 6 is added to original independent claims 1, 18, 19 and 20.

Also, the feature *wherein said at least one second PWB is connected to a ground plane associated with said first radiation structure* which is similar to original claim 5 is combined with the features of original independent claims 1, 18 19 and 20 to give new claims 22, 24, 25 and 26 respectively.

Furthermore, original claim 4 is cancelled, and becomes new claim 23 depending from new claim 22. Original claims 5 and 6 are also cancelled. Additionally, allowed claim 14 is merely placed in independent form.

Prior Art

On pages 1-4 of the present specification, the antenna structure is described with reference to Fig. 1. In this antenna structure, two radiation structures 2-1 and 2-2 are formed in a PWB 2 that is attached to an antenna carrier 1 and then covered by a

decorative label 4. Electrical contact to the radiation structures 2-1 and 2-2 through the antenna carrier 1 is accomplished by the conductive pogo pins 3-3...3-7, which connect to the noses 2-3...2-7 formed by the PWB2. Radiation structure 2-1 is described to be suited for GSM operation, whereas radiation structure 2-2 is described to be suited for GPS operation or the like.

The other prior art item is *Brown*, which discloses circuit modules that are assembled of one (see Fig. 1 and 1A), two (see Fig. 2 and 2A) or three (see Fig. 3, 3A and 4) double-sided printed circuit boards (PCBs). Each PCB can have coils formed as spiral traces on both sides thereof. The coils can be connected together, in series or parallel, to act as a coil antenna. Alternatively, the spiral traces can be connected to function as windings of a transformer (see abstract). The circuit modules composed of the PCBs then can be molded and used as transponders in pneumatic tires (see col. 1, I. 37-45).

Novelty of the Amended Independent Claims

The prior art does not teach or suggest the use of a second PWB as presently claimed. With respect to *Brown*, the circuit module 100 in Fig. 1 of *Brown* does not disclose a second PWB being attached to a second side of an antenna carrier. In circuit module 100 of Fig. 1 of *Brown et al*, only one double-sided PWB 102 is shown, but without an antenna carrier and, particularly, without a second PWB.

Applicant acknowledges that several features of the present amended claims may be considered to be disclosed by the circuit module 400 of Fig. 4 of *Brown*. The middle PWB 322' of Fig. 4 may be considered as an at least partially plane antenna carrier with a first side and a second side (see col. 9, I. 39-46). The double-sided bottom PWB 302' may be considered as a first PWB being attached to said first side of said antenna carrier and having a first radiation structure formed on it. Therein, the first radiation structure may be considered to be formed by the elongate traces 310' and/or 312' (see col. 9, I. 59-65). According to Fig. 5 and col. 11, I. 1-4 of *Brown*, the circuit module 400 of Fig. 4 can be encapsulated into a mold, thus the bottom PWB 302' may be considered to be attached to the middle PWB 322'. Finally, the double-sided PWB 342' may be considered as the at least one second PWB being attached to said second side of said antenna carrier.

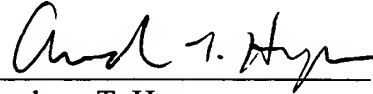
Nevertheless, *Brown* does not disclose the use of a PWB as a parasitic antenna element, or the use of a PWB that is connected to a ground plane of a first radiation structure, as presently claimed. In particular, it is noted that in the circuit module 100 of Fig. 1 of *Brown*, the conductive traces 110 and 112 formed on the PWB 102 are used as portions of an antenna coil (which does not require a ground plane anyway). Similarly, the other embodiments of circuit modules in Figs. 2, 2A, 3 3A and 4 of *Brown* only disclose the interconnection of the conductive traces formed on the different PWBs to either form portions of one coil antenna or windings of a transformer (see for instance Fig. 3 and the corresponding description in col. 7, I. 19-61, wherein conductive traces 310 and 312 of the lower PWB form a first winding of an air-gap transformer and conductive traces 350 and 352 of the upper PWB form a second winding of this air-gap transformer).

As mentioned, original claim 5 stated that the second PWB is electrically connected to a ground plane. A similar limitation now appears in new claims 22, 24, 25 and 26. Applicant wishes to mention that original claim 5 is different from admitted prior art (described at page 4 of the application) in that the decorative label 4, disclosed on page 4, lines 15-18, is only a protection layer in order to protect the flex-print 2 and in particular the radiation structures 2-1 and 2-2 from physical damage and corrosion, but this decorative label does not represent a Printed Wiring Board electrically connected to a ground plane. Thus, the material in original claim 5 is novel with respect to admitted prior art.

Applicant respectfully submits that the new and amended independent claims are novel with respect to *Brown* in view of admitted prior art. The prior art does not disclose the use of a second PWB either as a parasitic antenna element or as an extended group plane of a first radiation structure on a first PWB according the amended claims. According to the last paragraph on page 6 of the patent specification, this second PWB is particularly advantageous because it offers an additional degree of freedom in tuning an antenna that is at least partially formed by said first radiation structure on said first PWB. Said tuning may comprise the adjustment of the antenna gain for specific frequency and/or angular ranges.

In view of the foregoing amendments, it is respectfully submitted that the present application is in condition for allowance and such action is earnestly solicited.

Respectfully submitted,



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